3.0 WASTE ANALYSIS PLAN

3.1 INTRODUCTION

This Waste Analysis Plan (WAP) was prepared to support the Part B permit application for the Plant 1 portion of the ATK-Bacchus facility. The plan is intended to provide guidance and assistance in sampling and testing of the two general categories of hazardous waste at ATK-Bacchus. These two groups include "reactive waste", and "chemical waste". The term "reactive waste" consists of propellant and explosive waste, as defined in R315-2-9(f)(i), (ii), (iii), (vi), (vii) and (viii). The term "chemical waste" is the term used to describe all non-reactive hazardous waste, or unknown potential hazardous waste. This category could include drummed waste, lab packs, bulk wastes, waste from offsite ATK facilities, etc. The plan outlines a process for making a hazardous waste determination for both of these general waste categories. This plan will be on file with the Environmental Services group.

The WAP was developed to ensure that all reactive waste will be properly characterized prior to being stored and/or treated. The WAP also outlines how chemical wastes that are being stored prior to shipment to an offsite disposal facility will be characterized. Information on these waste chemicals is obtained from process knowledge, MSDSs, and chemical analysis.

3.1.1 Site History

ATK-Bacchus has been manufacturing explosives at this site for approximately 100 years. The facility started as a dynamite manufacturing plant, and later began building rocket motors and other related products. Refer to Section 2 paragraph 2.1.1 in this application for a complete site description.

3.2 WASTE ACCEPTANCE PROTOCOL

3.2.1 Acceptance of On-Site Reactive Waste for Storage and Treatment

All reactive wastes must be characterized before they can be accepted for storage prior to treatment. The characterization will identify the type of reactive waste as defined in Section 3.1 and determine whether the waste exhibits any additional hazardous waste characteristics and if it is listed in accordance with R315-2-9 and 10 UAC. ATK-Bacchus shall gather and maintain waste characterization information using, at a minimum, the following sources of reference information:

- Propellant name and formulation
- Propellant ingredient chemical information
- MSDS
- Generator process knowledge
- DOT Emergency Response Guide
- DOT hazard classification and supporting test data
- Chemical Propulsion Information Agency Manual

This information is used to categorize reactive materials into profiles. Internal profiles are necessary for accumulation and storage of explosive waste prior to treatment at the NIROP Burning Grounds. Profile information is conveyed to generators to assure explosive waste is properly prepared for treatment. Explosive waste is not accepted unless it meets profile requirements identified in Section 4.8.

The DOT has strict requirements for transportation of explosives as specified in 49 CFR 172.101 Hazardous Materials Table. Information used to obtain a DOT shipping classification for ATK-Bacchus explosive wastes is the basis of profiles with offsite TSDFs.

Any new propellants or other reactive wastes will be characterized using the above referenced materials before they are accepted for storage prior to treatment. Any waste that does not fit an existing profile, must be reprofiled before the waste can be accepted. In the event that a reactive waste cannot be properly characterized with existing information, additional information will be obtained, which may include laboratory analysis.

Laboratory wastes can be characterized using generator knowledge. Upon receipt of the reactive waste at permitted storage facilities, all containers are inspected to verify proper labeling, and packaging. The total quantity and type of propellant is then recorded as described in Section 4.3.1.

3.2.2 Acceptance of Hazardous Chemical Waste for Storage and Offsite Disposal

Hazardous chemical waste generated at the facility, and other ATK facilities are accepted for storage at HS-1. Upon receipt of all hazardous waste at HS-1, all containers are visually inspected to verify proper labeling, packaging and paper work. Upon acceptance the waste is entered into the chemical waste tracking system using the container number as the unique identifier.

All wastes received from an off site source have been characterized in advance, and are assigned a container number at the time of delivery. These shipments are visually inspected to verify that the type and quantity of the waste matches the profile and manifest. The manifest numbers for off-site generated hazardous waste are entered into the chemical waste tracking system upon acceptance. Waste generated onsite may be characterized after delivery to the permitted storage area following the protocol identifies in Section 4.6.

Whenever a waste is accepted all of the pertinent information on the waste is entered into the operating record. This information shall, at a minimum, includes the waste profile description, EPA codes, quantity, date of generation, date received, storage location and date it was shipped off site for disposal,. The chemical waste tracking system will also include the manifest number(s) for all hazardous waste received from an off site source and all off-site shipments of hazardous waste to a TSDF. At a minimum the following resources are used to help characterize chemical waste:

- R315-2 of the UAC
- Generator process knowledge
- MSDS
- Laboratory analysis
- National Institute for Occupational Safety and Health: Pocket Guide to Chemical Hazards

3.2.3 Acceptance of Off-site Generated Reactive Waste

ATK-Bacchus periodically receives reactive waste from off-site locations. This waste is accepted by ATK-Bacchus for storage prior to being shipped off-site for treatment and/or disposal at an approved TSDF. All off-site generated wastes must be approved in

advance according to the criteria in Section 4.8. Before the waste is accepted, ATK-Bacchus reviews the shipping papers and visually inspects the container(s) to confirm that container(s) and shipping papers agree and that the waste description meets the previously approved waste. Discrepancies will be resolved with the generator before the waste is accepted. After the waste has been visually inspected and accepted by ATK-Bacchus it will be entered into the explosive waste tracking system described in Section 4.3 and managed at one of the explosive waste storage sites described in Section 2.2.

3.3 TESTING CRITERIA

3.3.1 Parameters and Rationale for Testing Reactive Wastes

Reactive waste may carry several waste codes, but will always carry a D003 waste code for reactivity and such wastes are generally classified as explosives. Due to the inherent hazardous nature of reactive wastes, this material is not routinely sampled or analyzed as part of this WAP. In addition to classifying and characterizing the reactive waste managed at the ATK-Bacchus facility in accordance with R315-2 of the UAC, ATK-Bacchus will assess emission hazards associated with the open burning of these hazardous wastes as required in 40 CFR 264.601 Environmental Performance Standards. Figure 3-2 the Reactive Waste Treatment and Disposal Decision Matrix, diagrams the steps and decisions that are addressed whenever reactive waster are treated and subsequently disposed.

3.3.2 Parameters and Rationale for Testing Chemical Waste

ATK-Bacchus generates two general categories of solid waste that can be defined as hazardous in accordance with R315-2 of the UAC: 1) off-specification commercial chemical products, and 2) spent materials. Figure 3-3 the Chemical Waste Characterization and Disposal Decision Matrix, identifies how ATK-Bacchus will decide whether a waste is hazardous as defined by R315-2 of the UAC.

Off-specification commercial chemical products are chemicals that have not been altered from their original manufactured formulation but are discarded for some reason. The most common reason for discarding these chemicals is because they are no longer needed or the shelf life has been exceeded, generator knowledge can be used to characterize these wastes. Detailed information on commercial chemical products is available on the MSDSs.

A spent material is any material that has been used and as a result of contamination can no longer serve the purpose for which it was produced without being processed or reclaimed. ATK-Bacchus has process knowledge for all of its spent material waste streams. Annual evaluation will be performed to verify chemical composition and concentration ranges. All new or modified spent material waste streams will be initially assessed at the point of generation and annually thereafter to maintain proper characterization of all waste streams.

3.4 TEST METHODS AND SAMPLING

3.4.1 Test Method [40 CFR 264.13(b)(2)]

ATK-Bacchus will make a hazardous waste determination for all waste streams generated, stored or treated onsite. This waste stream evaluation will be made utilizing process knowledge and/or analytical testing. All analytical testing will be completed at a Utah certified laboratory. Only EPA approved test methods, selected from the most current version of SW-846 list ("Test Methods for Evaluating Solid Waste, Physical and Chemical Methods"), will be used. Test method selection will be made, based on the

most applicable method as described in Chapter Two of the SW-846 publication. New test methods will be used only after they have been approved by the EPA. The laboratory will certify new methods during the annual certification process. Specific methods which may be used to characterize wastes are listed in Figure 3-4.

3.4.2 Sampling Methods [40 CFR 264.13(b)(3), 261 Appendix I and UAC R315-8-2.4]

Waste sampled at the ATK-Bacchus facility consists of new waste, unknown waste, waste from changed processes, and waste sampled for annual re-verification analysis. Representative samples will be collected and handled in accordance with the procedures and protocols identified in Table 3-1. At a minimum the following safety precautions are used when sampling waste materials:

- Chemical resistant gloves and safety glasses will be used while sampling all waste. Based on the chemical hazards and splash potential, protective clothing and a splash shield or respirator may also be utilized.
- Non-sparking tools will be used to sample any waste that presents a fire hazard.
- All necessary equipment and materials will be available prior to sampling

Table 3-1

	Container/Containment Type					
Waste Matrix	**Drums, Totes**	**Boxes, Bags, Sacks**	**Storage Tanks**	**Ponds, Lagoons, Pits**	**Tankers**	**Roll-Off Bins**
Free Flowing Liquids/Slurries	Coliwasa	N/A	Pump/Dipper	Dipper	Dipper	N/A
Sludges	Trier/Spoon	N/A	N/A	N/A	N/A	Trier/Bucket/Shovel
Moist Powder/Granules	Trier/Spoon	Trier/Spoon	N/A	N/A	N/A	Trier/Shovel
Dry Powder/Granules	Thief/Spoon	Thief/Spoon	N/A	N/A	N/A	Thief/Shovel
Sand/Packed Powder	Auger/Spoon	Auger/Spoon	N/A	N/A	N/A	Auger/Shovel
Large Grained Solids	Large Trier/Spoon	Large Trier/Spoon	N/A	N/A	N/A	Large Trier/Shovel
Debris (i.e. Rags, Gloves, Towels, etc.)	Rag[1]	Rag[1]	N/A	N/A	N/A	Rag[1]

[1] The rag technique is used for sampling solid material such as rags, gloves and paper towels. After a container has been selected, it is opened and a representative sample collected and placed in the sample container. One or more of the varied materials (e.g. gloves, tongue depressors, rags, paper, plastic, etc.) is sampled depending on the mix of the container.

A variety of sampling equipment and materials will be used to collect waste samples. All reusable equipment will be washed with a detergent solution and thoroughly rinsed before re-use. Disposable equipment may also be used. This equipment and specified sampling methods are described in the SW-846 publication.

Drummed consolidation waste will be randomly sampled each year as outlined in the table below. "Average Monthly Drum Number" will be based on the previous calendar years average monthly drum inventory, for each waste stream. Samples will be obtained in the first quarter of each calendar year.

Table 3.1	
Average Monthly Drum Number	Aliquots Selected
2 to 8	2
9 to 27	3
28 to 64	4
65 to 125	5
126 to 216	6
217 to 343	7
344 to 512	8

The above table is based on a table found in ASTM D 140-70, "Standard Methods of Sampling Bituminous Materials," ASTM D 140-70.

All sample containers used during a sampling event will be new, and certified clean from a reliable source. Container selection will be based on the chemical/container compatibility, physical state and sample volume. A label will be attached to each sample container which will include the following minimum information:

- Sample number
- Samplers name
- Date
- Time
- Location

In addition to the information included on the label, the chain of custody, which accompanies all waste characterization samples, will also include the following:

- Composite or grab sample
- Number of containers
- Remarks section
- Relinquishment signature block

All samples will be preserved as specified in SW-846 while in storage at ATK-Bacchus and while in transit to the testing laboratory.

3.5 FREQUENCY OF ANALYSIS

3.5.1 Frequency of Analysis for Reactive Waste [40 CFR 264.13(b)(4) and UAC R315-8-2.4]

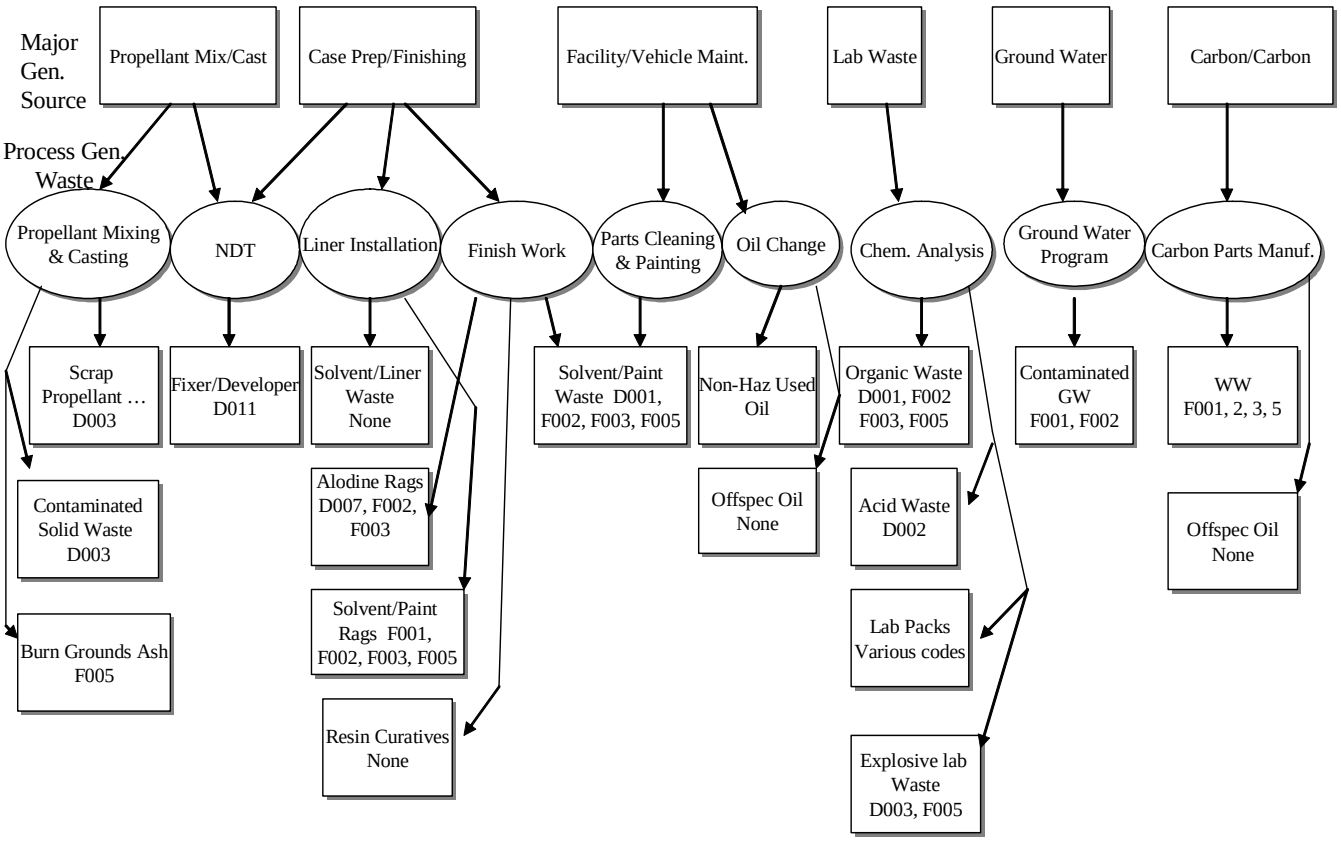
All waste treated at the NIROP Burning Grounds are generated at the ATK-Bacchus facility. These reactive wastes are derived from energetic materials that have been

manufactured to strict specifications. Therefore, the chemical composition of each formulation is well known. As discussed above, ATK-Bacchus characterizes all reactive waste streams using generator knowledge. While these energetic waste streams are not analyzed prior to being treated, ATK-Bacchus does review the reactive waste profile on an annual basis or any time the manufacturing process changes.

3.5.2 Frequency of Analysis for Chemical Waste

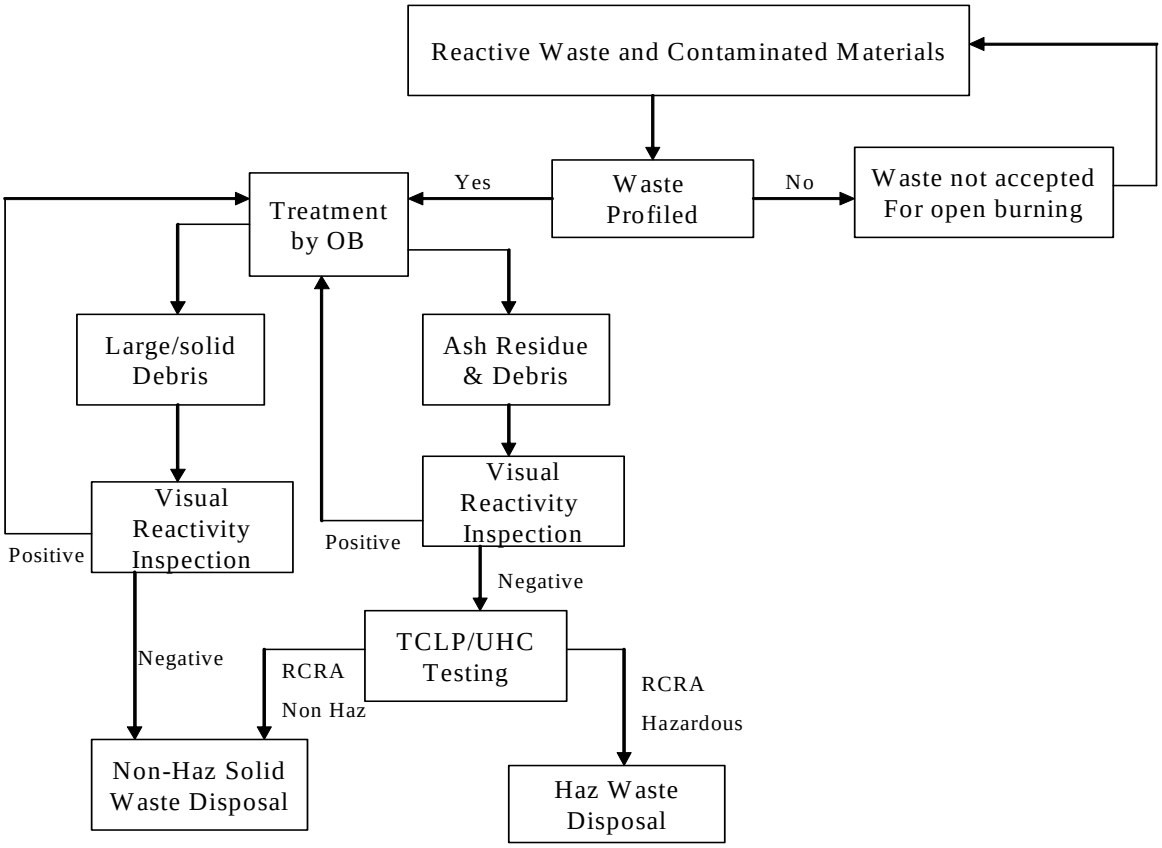
The industrial processes at ATK-Bacchus generate a number of routine waste streams. Figure 3-1 shows major waste streams and process generating the waste. These waste streams will be evaluated annually to verify waste characterization is still accurate. The waste characterization will also be re-evaluated whenever the process that generated the waste changes to determine if the process change altered the characteristics of the waste stream.

Off specification commercial chemical products are well characterized by the information of their MSDSs. These wastes are not analyzed on a routine basis.

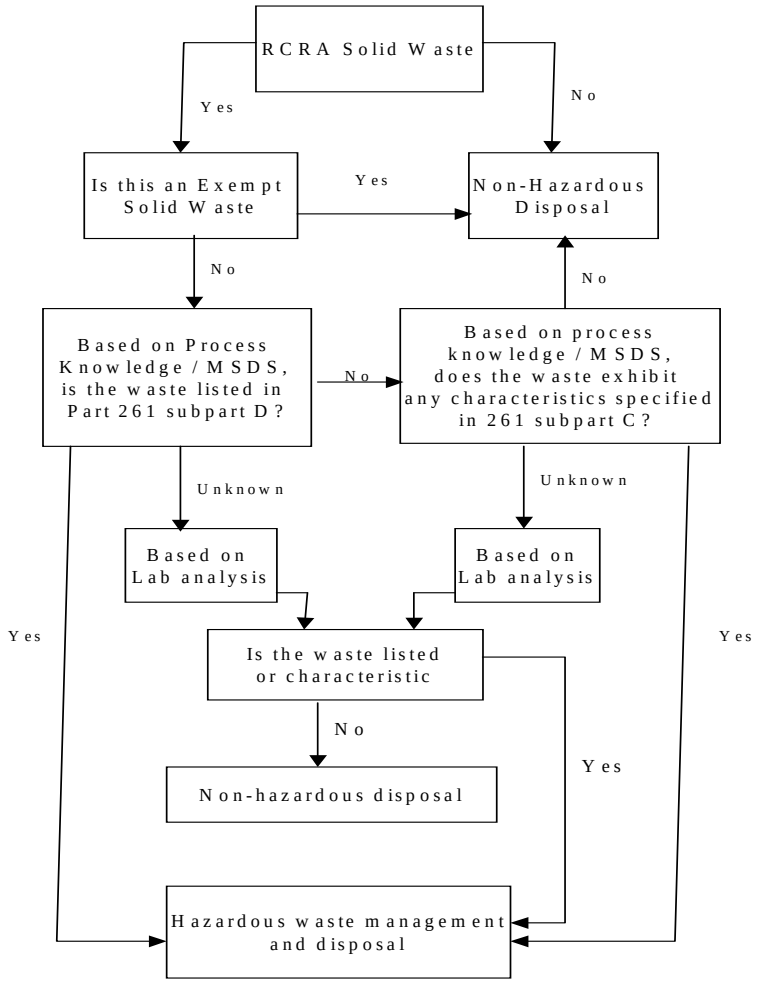


Note: The EPA codes included above are primary codes only; The above list includes major waste streams only.

ATK- Bacchus Waste Generation
Figure 3-1



Reactive Waste Treatment and Disposal Decision Matrix
Figure 3-2



Chemical Waste Disposal Decision Matrix
Figure 3-3

Figure 3-4

Analytical Methods for Metals

Parameter	Analytical Method	Preparation Method *
Arsenic	EPA 6010B	EPA 3005A (W) & 3050B (S)
Barium	EPA 6010B	EPA 3005A (W) & 3050B (S)
Beryllium	EPA 6010B	EPA 3005A (W) & 3050B (S)
Boron	EPA 6010B	EPA 3005A (W) & 3050B (S)
Cadmium	EPA 6010B	EPA 3005A (W) & 3050B (S)
Chromium	EPA 6010B	EPA 3005A (W) & 3050B (S)
Copper	EPA 6010B	EPA 3005A (W) & 3050B (S)
Lead	EPA 6010B	EPA 3005A (W) & 3050B (S)
Manganese	EPA 6010B	EPA 3005A (W) & 3050B (S)
Mercury	EPA 7470A (W) & 7471A (S)	EPA 7470A (W) & 7471A (S)
Molybdenum	EPA 6010B	EPA 3005A (W) & 3050B (S)
Nickel	EPA 6010B	EPA 3005A (W) & 3050B (S)
Selenium	EPA 6010B	EPA 3005A (W) & 3050B (S)
Silver	EPA 6010B	EPA 3005A (W) & 3050B (S)
Thallium	EPA 6010B	EPA 3005A (W) & 3050B (S)
Vanadium	EPA 6010B	EPA 3005A (W) & 3050B (S)
Zinc	EPA 6010B	EPA 3005A (W) & 3050B (S)

Analytical Methods for Organics

Parameter	Analytical Method	Preparation Method
Volatle Organics	EPA 8260B	EPA 5030B (W) & 5035 (S)
Semivolatile Organics	EPA 8270C	EPA 3510C (W) & 3550B (S)
TPH	EPA 8015B	EPA 3510C (W) & 3550B (S)
TOC	EPA 9060A (W only)	EPA 9060A (W only)
Oil & Grease	EPA 1664A (W only)	EPA 1664A (W only)

Miscellaneous Test Methods

Parameter	Analytical Method	Preparation Method
pH	EPA 9040C (W) & 9045D (S)	EPA 9040C (W) & 9045D (S)
Ignitability	EPA 1010A (W only)	EPA 1010A (W only)
Toxicity	EPA 6010B/7470A (Metals) EPA 8260B (Volatile Organics) EPA 8270C (Semivolatile Organics)	EPA 1311/3010A EPA 1311/5030B EPA 1311/3510C
Explosives	EPA 8330	EPA 8330
Perchlorate	EPA 314.0	EPA 314.0
Anions	EPA 9056A	EPA 9056A (W) & 5050 (S)
TSS	SM 2540D	SM 2540D
TS	SM 2540B	SM 2540B

* The 'W' indicates a water matrix. Samples that are water soluble liquids (or aqueous phase) fit into this category. Non-aqueous liquids are usually treated as solids depending on the test method. In the case of an oil matix that cannot be analyzed by the solid preparation method, a waste dilution is often performed. The ‘S” indicates a solid matrix.